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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,680	08/18/2003	Brenda D. Kraus	MI22-2310	4607
21567	7590	10/12/2006	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			TALBOT, BRIAN K	
			ART UNIT	PAPER NUMBER

1762

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/643,680

Applicant(s)

KRAUS ET AL.

Examiner

Brian K. Talbot

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-64 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Art Unit: 1762

1. The response filed 7/31/06 has been considered and entered. Claims 1-64 remain in the application.
2. In light of the arguments filed 7/31/06, the 35 USC 103 rejection has been withdrawn, however, the following rejection has been necessitated.
3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Art Unit: 1762

Claims 1-8,10-12,16-25,29,33-43,45-47,51-54,58 and 62-64 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Kang et al. (7,098,131).

Kang et al. (7,098,131) teaches a method of forming atomic layers and thin films including tantalum nitride and devices including the same. A tantalum amine derivative reactant is introduced onto a substrate, chemisorbing a portion of the reactant on the substrate, removing non-chemisorbed reactant from the substrate and introducing a reactant gas onto the substrate to form the nitride film (abstract). TiN can be formed on the substrate by introducing a reacting gas to remove a ligand-bonded element from the chemisorbed reactant. The ligand-bonded element can be removed using a compound that comprises H<sub>2</sub>, NH<sub>3</sub>, SiH<sub>4</sub> or Si<sub>2</sub>H<sub>6</sub> or a combination thereof. Activation of the reacting gas can be done with a remote plasma which may prevent damage of the substrate (col. 6, line 19 – col. 7, line 40)

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9,13-15,26-28 and 30-32,44,48-50,55-57,59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kang et al. (7,098,131).

With respect to claims 9,13,44 and 48, the claims recite removing the ligand or organic component with carbon monoxide or an agent not having hydrogen.

While the Examiner acknowledges the fact that art is silent with respect to the claimed “ligand-removers”, it is the Examiner’s position that one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar results regardless of the type of ligand-remover utilized as long as it is capable of removing the ligand to produce the metal nitride. The claimed “removers” are known in the art to perform this function and absent a showing of unexpected results regarding the specific “remover”, one skilled in the art would have a reasonable expectation of success.

With respect to claims 14,15 and 30-32,49,50 the claims recite forming a nitride comprising hafnium, titanium or carbon with precursors thereof.

While the Examiner acknowledges the prior art fails to disclose other metal nitrides, it is the Examiner’s position that one skilled in the art at the time the invention was made would have had a reasonable expectation of achieving similar results regardless of the metal nitride produced.

With respect to claims 26-28,55-57 the claims recite a reduced pressure during the chemisorbing step versus the removing step.


While the Examiner acknowledges the fact that Kang et al. (7,098,131) teaches “constant pressure” during the process, it has been well settled that the mere “optimization” of well known “result effective variables” is deemed as an obvious modification absent a showing of unexpected results garnered from the variable.

Art Unit: 1762

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Brian K Talbot  
Primary Examiner  
Art Unit 1762

BKT